

FREQUENCIES VHF, UHF, SHF NEWSLETTER

NZ This newsletter is compiled by Kevin Murphy ZL1UJG to promote operational and construction activity on the VHF, UHF and SHF Amateur Radio allocations in New Zealand (and overseas).

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VHF Scene (mainly)

EDITORS NOTES

Due to other commitments, I didn't produce a newsletter with the Jan/Feb VHF Scene. However this issue has two VHF Scenes in it. I am starting on the next VHF Scene for the next issue of Break In and would like material for that. The date for sending the column off to the Break In Editor is 10 May, so would appreciate any material ASAP

Beacons and Repeaters News

ZL3TMB advises that the Branch 05 6 metre repeater is operational from Cass peak on 53.850 MHz with a 1 MHz negative split. Note the ZL band ends at 53 MHz so one can listen to the output frequency only..

ZL3KB advises that the Branch 05 ZL3VHF and ZL3UHF beacons are operational on 144.285 and 432.285 MHz with 10w to vertical antennas in both cases. They transmit CW and send callsign and Maidenhead Loc every minute with plain carrier between calls. Call periods are sequential with ZL3VHF calling first.

**(Both items from Q-BIT Wellington VHF Group Newsletter April 05 Issue)

Excellent news. I am sure that there will be many reports

EME on 47 GHz

April 16, 2005 - Announcement of the first QSOs via the moon on 47 GHz.

The team of RW3BP, AD6FP, W5LUA, and VE4MA would like to announce that the first 47 GHz contacts via the moon have been completed. As you may recall, RW3BP heard the first lunar echoes on 47 GHz back in August of 2004. At that time he was heard by AD6FP, W5LUA, VE4MA and VE7CLD. Since the receipt of the first 47 GHz echoes via the moon, numerous tests between RW3BP and AD6FP led to improvements by RW3BP allowing him to copy calls from the lower power signal of AD6FP in January of 2005.

As of April 16, 2005 the team of AD6FP, W5LUA and VE4MA have each completed a CW QSO via the moon with RW3BP.

The station at RW3BP consists of a 2.4M offset fed dish and 100 plus watts while the station at AD6FP consists of a 1.8M offset fed dish and 30 watts. At W5LUA and VE4MA 2.4M offset fed dishes and 30 watt TWTs were used. Noise figures of all stations are in the 3.5 to 4.7 dB range.

Since the doppler shift can be as much as 100 + kHz at 47 GHz, one must continuously adjust the receive frequency to keep the station centered in the passband. Precision frequency control was obtained by using GPS controlled, Rubidium locked, or TV sync controlled phase locked local oscillators. Various techniques were in use to keep the Doppler shifted frequency in the passband of the receivers.

Submitted by RW3BP, AD6FP, W5LUA and VE4MA (reported via WA1MBA microwave reflector)

VHF SCENE

PLEASE ACKNOWLEDGE NZART/BREAK IN/VHF SCENE IF USING VHF SCENE MATERIAL IN ANY OTHER NEWSLETTER. THANK YOU

Jan/Feb VHF Scene , 2005

During this time of the year there have been a number of good DX opening's to Australia, even though the summer weather here in NZ hasn't been typical. A number of contest stations have also fed in their observations from VHF Field day. These and other VHF/UHF activities have presented an interesting column. Keep the information coming.

VHF Convention

The Wellington VHF Group is hosting the 2005 VHF Convention, held at Easter.

They are planning a good selection of speakers, a mobile fox hunt, a forum to discuss matters, and also a special session on the National System frequency change. There will be talks on the projects underway in the Group - Project 39, which aims to get ATV repeaters going across the country, and the 10 GHz project which is converting a number of "RF Bricks" to amateur use. The 10 GHz project should be ready to take orders at the convention.

(John ZL2HD)

Beacons

The ZL3SIX/B and ZL3TEN/B beacons are back on air after a few power supply problems in late November. The 40A power supply had the filter capacitors replaced after drying out and a few weeks later the bridge rectifier had shorted (Mike ZL3MF)

DX

On 26th November, 2004 around 9.30 - 9.45 pm NZDST Murray ZL3MH heard Australian signals on sporadic E. These included 144.100 SSB and 148.240 MHz pagers and also Ch5A video 138.250. They were received on a 11 element Vertical 2m beam feeding a Uniden 780 Scanner. Murray runs on 2m a FT101ZD Mk2 driving a FTV250 transverter to a AM17 Amplifier (400w pep) to LDF450 coax, which feeds a 12 element beam (designed by GordonVK2ZAB) up at 10 meters. Mike ZL3MF (ex ZL3TIC) alerted Murray to the possible opening. Nothing was worked but Murray is hopeful next time. 6m was open to VK2 and. Murray ZL3MH worked VK2BHO and VK2ARA, as well as hearing the 50.288 MHz beacon at S9

During the same day, Simon ZL1SWW heard a 6m opening which gave signals from FK1TK. Conditions then progressed to 2m, with Simon hearing VK2 and VK4 stations on 2m around 0230 UTC. Initially there was heavy QSB but this decreased as the day went on. Stations heard working the DX were ZL1BK, ZL1TN, ZL1IU, ZL3NE, ZL1AVZ.

A full activity report from Tim ZL1TN:-

On the evenings of November 29th and 30th and December 1st, openings on 2m produced signals from VK2 and VK4 into the Auckland area, On December 1st Tim, ZL1TN and Harry, ZL1BK went portable to a high location in Auckland's Eastern suburbs, where a RS59+ contact was made to VK4LC, on the Gold Coast, and a RS51 contact with Trevor, VK4AFL, in Brisbane. Several VK4s had been heard on the Auckland 2m repeaters from Sunday evening till around 9pm on Wednesday 1st Dec.

Several openings have occurred from ZL1 to VK2/4 on 6m, with several VK2 stations being worked in the last period of the December VHF/UHF field day contest, and the Newcastle beacon on 50.288 MHz was audible when we dismantled our field day station.

Another opening occurred. in Auckland, on the 26th December. It started on the evening of the 25th with VK signals on 6m from VK2,3,5, and VK7. VK5UBF was audible for several hours, but was unable for some reason to hear me. We made contact with VK7RR at 5/9 but conditions seemed to drop around 22:00 ZL time. VK TV on 46.171, .240 all 5/9+++ most of the evening with Sound carriers also very strong. No FM broadcast or 2m activity noted that day in Auckland.

On 26th December, while enjoying lunch at his favourite portable location, a tune around the FM broadcast band revealed many very strong stations. 2m was wide open, with pagers audible, the strongest, 148.6375 was

S9 on his mobile rig. I Worked VK4HOB on the VK4RAI 146.9 repeater, and could trigger VK2RMB 146.875, and another on 147.000.

Later, from the same site we had contacts on 144 MHz to VK2FI, VK2EI, VK2DVZ, VK2ZCV. We heard VK2ZAB Gordon, and several others on 144 MHz, and no contacts were completed on 432.

Conditions seemed to deteriorate around 17:00 local with signals dropping away from then on. (Tim ZL1TN).

A report from Mike ZL3MF on the same opening

A very good opening on the 25th to VK7 on 2m all started at 0700 utc and lasted to 0856...2hrs !! 6m had also been open for most of the day. Signals had also been very strong on ZL/VK Low band TV channels. Local 75 MHz Mobile RT traffic was also been interfered with, with signals crossing between ZL and VK. The FM band was full of strong VK Broadcast FM stations

Stations worked between 0714 and 0852 UTC were:- On FM Bob ZL3ADH and ZL3WM (via a VK Rptr), VK7YBI, VK7BBW, VK7YBI. While on 144.1 MHz SSB, VK7ZOO, VK7BBW, VK7YBI, VK7KRR, VK7JG, VK7XQ and VK7YBY were worked. A number of other repeaters were heard and Norm, VK3DUT was heard on 144.100 MHz but not worked.(Mike ZL3MF)

ATV Update

The Ch39 repeater at Nihotupu, Auckland has had an upgrade, with a Barco modulator/upconverter installed. The original Philips unit was over 30 years old. A TX output Bandpass filter has also been fitted. The Whitford site is still awaiting pole replacement. (Quentin ZL1QF)

On the DATV front, Grant ZL1WTT, Auckland has been working on DATV experiments since early December. He has been testing the system at 10 watts on 1282 MHz at a symbol rate of 10 Mb with $\frac{3}{4}$ error correction mode. He has a number of test signals multiplexed together into the transmitted signal.

Contests

The December Field day was a little damp.(It doesn't appear to have stopped raining since as the scribe writes the column in early January). Conditions were not too favorable overall. A few stations have sent notes on their experiences.

From Steve, ZL1TPH:-

Band conditions were not that great and despite bad weather numerous contacts were made. My single operator portable station was operated from the car at Moirs Hill, north of Auckland (358 m asl). Bands covered from 144 MHz to 10368 MHz (excluding 622 MHz). Because conditions were well below average on all bands, this tested the equipment performance, hence low noise RX amplifiers and power amplifiers were needed.

My best contacts on 144 MHz were into Wellington to Branch 74, ZL2WA/p at Belmont and also to Dick (ZL2TGQ), (homestation) at ~550 km. Thanks go to Leon and the Team and also Dick. Propagation mode was forward scatter (troposcatter)

On Saturday evening Harry, (ZL1BK), Mt Ruapehu (318 km path) was louder on 1296 MHz than on 432 MHz, allowing a SSB contact to be made on 2424 MHz. Conditions reversed on Sunday with 432 MHz being stronger. A number of contacts were made into the Taranaki region (~310 km) on 144 thru to 1296 MHz, where ZL6EE, Ted (ZL2IP) and Ray (ZL2TAL) were active. The path north to Nick (ZL1IU) at 155km was not great on 1296 MHz. ZL1BQ provided contacts on all bands (except 2424 MHz).

The ZL1BQ team consisting of Peter (ZL1UKG), Vaughan (ZL1TGC) and Tim (ZL1TN) also sent a report. The station began late due to gates being locked. Weather was cold, calm and wet during setting up and therefore not all antennas were setup. Antennas were Horizontal. (No FM stations worked) Torrential rain overnight gave way to strong winds with some stations reporting wind noise was reducing intelligibility. A 6m opening to Wollongong was very localised with all stations in a 30 km radius. Propagation was generally poor around the ZL1BQ/p site, with Hepburn confirming this.(Peter ZL1UKG).

The scribe gave some contacts on 144 MHz during Sunday, but conditions were unfavorable from Hamilton, generally. I waited for QSB peaks, which enabled some contacts to ZL1BQ. I was heard by Simon ZL1SWW, but no contact resulted. I had a listen for Steve on 1296 MHz and only a very weak carrier was heard, resulting in no contact. Colin ZL2TFK was also active from Hamilton on 144 and 432 MHz.

There were a number of stations active on 1296 MHz in the upper North Island region, such as Ian ZL1AOX, Simon ZL1SWW, Ralph ZL1TBG, Brian ZL1AVZ, Peter ZL1UKG (as ZL1BQ), Nick ZL1IU, ZL6EE and Harry ZL1BK,. Harry had his PA die during the contest and still worked Steve at 318km with the 2W transverter.

On 2424 MHz, Steve ZL1TPH and Brian ZL1AVZ could both copy Nick ZL1IU, near the Bay of Islands, but no full QSO's resulted. Quentin (ZL1QF), operating from Foley's Quarry road, near Albany, Auckland provided

Steve with some 13cm contacts, as did Harry ZL1BK. Quentin (ZL1QF) had gear for 6 and 2m and also 70cm. His best contact on 2m was to Harry (ZL1BK), and although Harry heard Quentin's signals on 70cm, no contact resulted.

Ian, (ZL1AOX) has become active on 3399 MHz. Even at 50mW TX power this resulted in a number of useful contacts between Steve ZL1TPH and Brian ZL1AVZ.

EME

Due to other interests during 2004, Brent, ZL1KA has had light activity on 23cm EME. His setup is reliable and even after some months inactivity, he fired up the station and had an excellent QSO with Franta OK1CA during December. Brent runs about 70 watts

The Auckland University of Technology has requested use of the dish for Radio Telescope experiments regarding Very Long Base Interferometry. (VLBI). That sounds very interesting and I am sure there is a lot of information to be gained on both sides. Also it says something about the quality of Brent's Setup.

Bob, ZL3TY has been quite active on 144 MHz EME. After encouragement from Gary, KB8RQ, Bob got his GU74b amplifier working at 400 Watts o/p for the ARRL EME contest during the 1st weekend in December. While he had 3 QSO's during the contest to RN6BN, W5UN and KB8RQ, the rest of the month proved to be very successful with QSO's to SP2OWF, EA3DXU, DL8YHR, 9H1PA, 9H1TX, UA9SL, SP6GWB, VK7MO, F6FHP, W8BYA, EA6VQ, ON4IQ, ON4GG, PA2CHR and OH7PI. All QSO's were on WSJT JT65b mode. Bob thinks the QSO to F6FHP exceeds the current CW world distance record by about 7 km.

Bob runs a TS790A transceiver (a masthead preamp is to be fitted soon!). The antennas are 4 by 12 element K1FO Yagis (as seen in ARRL handbooks). The antenna is fitted to a 10m galvanised pipe tower with azimuth control by a HD73 rotator and elevation by a TVRO dish actuator.

Bob's European window occurs at his moonset and his QSO's may only last 30 mins. Skeds are prearranged and a logger at www.chris.org/cgi-bin/jt44eme is useful in this regard. (Bob, ZL3TY)

Microwave

Brent is building up a mobile/portable station for the VHF/Microwave bands up to 10 GHz. Loop yagi kits for 23cm and 13cm from Harry ZL1BK have helped with this project.

Ray ZL2TAL is working on his 3399 MHz capabilities. He has a loan transverter and is constructing a loop yagi kit from ZL1UJG.

Simon has presented his progress on his Minikits 1296 MHz transverter at his www.qsl.net/zl1sww site. He has included information on using a micro as a sequencer, even down to generating a -5 volt supply with it. His 4 watt signals were heard in the Auckland region during VHF Field day.

A number of contest QSO's reported, had been with low power transverters (some less than 100mW) and less than optimum antennas. Useful distances in the region of 100km had been worked. One doesn't require high power to have fun on the bands



As mentioned in the Contest section, Nick is on 2424 MHz. Nick has a 1 watt transverter in a waterproof enclosure right behind the dish which is ~ 12 metres above ground. This is certainly an excellent idea as it removes coax losses from both the TX and RX side and will certainly improve reception at both ends. Even at low microwave frequencies, like 23 and 13cm, the loss in RG213 coax can be very high. High grade coax is highly recommended. With high grade DX or EME stations like Brent ZL1KA's equipment, the preamplifier is fitted virtually on the antenna itself, (as the picture shows) so that the losses are minimised and the best signal to noise is obtained for both stations. The transmitter is fed to the antenna via very

low loss coax, or in some cases the final amplifier is fitted close to the antenna.

March/April VHF Scene, 2005

There have been a small number of DX openings both to Australia and inside NZ during the last few months. Repeaters are a large part of VHF/UHF activity. I have heard of repeater work such as repair and construction happening, but virtually no information about repeaters is sent in for the column. Please send information, regarding any work on repeaters or unusual contacts via repeaters, as well as any other information relating to VHF/UHF activities. Good quality images are also wanted for the column.

With the increased activity on the higher bands, is there interest at starting an activity night, perhaps around 7.30 to 8 pm? Contacts could start on 2m, increasing in frequency as conditions permit. Which would be the most suitable night. Feedback for the next column please.

VHF Convention

By the time the next issue of Break In comes around, the VHF convention will have finished, and hope there is a report on it. As well as many other presentations, both Bob and I are giving talks, Bob's presentation is about Moonbounce and I will be talking about transverters.

Beacons

On the 4th March, Chris ZL2DX was hearing the Auckland and Waikato 2m beacons quite strong and also the Auckland 6625 repeater was at 59 +20. As mentioned before repeaters can be used as a good indication of improved conditions. Nick ZL1IU also monitors distant beacons as comments show later in the column.

DX

Nick, ZL1IU, during 15th and 16th January used good conditions locally and across the Tasman to work across to VK2 area and work several stations in and around the Sydney area on 2 and 70 cm.

On the 15th Of Feb. there was another opening to VK2 in which he managed to work a few stations around Sydney again.

On the 1st March, Ross VK2DVZ worked Nick ZL1IU at RS 51, 54 on 2m and also worked Brian ZL1AVZ at RS 51, 55 on the 2nd March.

Bob, ZL3TY was away over Christmas which meant he missed the big 2m opening to VK2/3 on Boxing day. However on 15 January, Channel 5A appeared and during the day he worked VK2APG, VK2FZ, VK2DVZ, VK2AWD and Nick ZL1IU. On 25 January Ch5a appeared weakly and nothing worked on 2m.

John ZL2TWS has updated records for 2004 and has rules approved by NZART council. For further info go to <http://www.nzart.org.nz/nzart/vhf/index.html>.

ATV

ATV news from Tony ZL4TAO:- During January, when the weather produced enhanced propagation, the Christchurch and Oamaru TV groups achieved a TV link from the Oamaru TV repeater to the Christchurch TV repeater, in colour and low-level sound. The signal originated from ZL4TAO, 22km SW of Oamaru on 23cm, was picked up by the Oamaru repeater and repeated also on 23cm from the dual PA's. An 18 watt PA directed the signal the 165 km to Banks Peninsular near Little River where it was received by a cross band link, (Receiver on 23cm and Transmitter on 13cm). The signal was received at Rolleston by a Christchurch TV group member and re transmitted on 23cm to be received by the Christchurch TV repeater and finally radiated on CH 39! A "four hop" link! (Whew!) These links at present are of a "strictly temporary" nature until the experiments have been fully proved! More work on this link is on going, with the aim to permanently link the two repeaters in both directions, and also have remote control. Further details of the Little River link at <http://www.gsl.net/g6uyj/lr-atv.html>

Contests

Upcoming VHF and UHF contests are in April and July. Further information may be obtained from the NZART website.

The Cliff Betson Memorial Contest held in mid January was won by Ian ZL1AOX, with 2nd and 3rd placings held by ZL1SWW and ZL2MA. Favorable conditions allowed some contacts to VK on 2m and 70cm

EME

Update from Rod, ZL3NW:- After a third sked between Ian MOBCG and my station ZL3NW, we had a successful EME contact using the digital mode JT65A on 6 metres. It was interesting as the first two skeds I had 100% copy but Ian could not see any sign of me. On our third sked on the 24 January 2005 at 1607z we completed our contact and were even able to exchange "73" at the end of our transmissions. It was noted the sporadic E propagation which was at high level between VK and ZL during early January had all gone and on a local basis the band was very "dead". I suspect this may be a factor making the EME contact possible. Ian uses a bay of four 5 element Yagis and I use a single 10 element Yagi and the contact was made with the moon just a few degrees above the horizon. It is understood this is the first 6 metre contact between New Zealand and England.

Bob, ZL3TY had a good time on 2m EME (Moonbounce) during mid to late January, with the following stations being worked.

15/1:- PA0MJV, S53J

16/1:- K7MAC, JH2COZ and KG6DX

19/1 thru 25/1:- W7EME, G4FUF, SM5CUI, SM5TSP, UR5LX and F8DO

26/1:- PA1GYS, PA3DZL, PA5DD, UA9FAD

27/1 :- DF2ZC and F9HS

28/1:- OZ1IEP, OK1DFC, RU1AA and ZS5LEE

29/1:- LY2BAW, DL7UAE and ST2RS

30/1 thru 31/1:- SM7BAE, W8WN, JH5FOQ and VK7MO

Working ST2RS was satisfying; as some will know this was Bob ZL1RS who was in Sudan until 15 February

Most of my activity in March has been on 2m EME with a total of 17 QSOs with stations in DL, JA, OH, OE, OZ, W, UA9, SM, SV, S5, W, 5B. All contacts using digital mode JT65b.

Also had a meteor scatter QSO with VK7MO on 27 Feb

Joe Taylor K1JT released V4.9 of WSJT in January. The main change is an improved decoder for JT65, the EME mode. K1JT says tests show an improvement of up to 4dB in sensitivity over the previous version. My experience to date supports this. Several of the stations worked with the new V.4.9 were using single Yagis, best was Joop PA0MJV who was using a single 12 element Yagi.

Microwave

(NZ Record... Almost) During the Cliff Betson Memorial contest weekend, conditions improved on Sunday allowing Nick, ZL1IU to have 1296 MHz QSO's with Chris, ZL2DX in Martinborough and Dave, ZL2BW in Nelson. The contact with Chris was only a few km's shy of the current record for a 1296 MHz contact inside NZ. All stations were running about 10 watts. What was notable was that the antenna at the station of ZL2DX was a simple twin quad loop antenna or "8". An Internet search using Google with "Quad loop 23cm" bought many hits. The antenna provides moderate gain in the region of 10 dBi.

Ray ZL2TAL as well as having contacts with Nick on 1296 MHz, assisted with setting up the contact between Nick and Dave. Ray, ZL2TAL also had a contact with Harry ZL1BK, who was running a 1 watt transverter at 1 Tree Hill in Auckland. Tom, ZL1THG and Kevin ZL1UJG also contacted Harry with his signals in Hamilton being quite weak. I (ZL1UJG) also heard Nick's 1296 MHz carrier, but no contact resulted. Nick's 2m signal in Hamilton was at times equal in level to the local 2m beacon!!

Nick ZL1IU notes on the 23 and 13cm bands:- During good conditions on the 15th and 16th January, the Wellington 2 and 70 cm beacons were coming in well here so I decided to check the 1296 MHz Wellington Beacon and there it was, easily identifiable over more than 24 hrs! I got hold of Chris ZL2DX and we worked on 2m, then moved to 70cm, made a nice qso and then to 23cm where signals were as good as on 70 cm. We made contact on 1296 MHz RS5/1 both ways and also had a couple more contacts in the next hour or so. I also worked Ray ZL2TAL on 1296 MHz where Ray was bouncing his signal off Mt. Egmont to work me. Apparently he has done this often in the past when working others. When he tried the direct path his signal dropped dramatically. He got hold of Dave ZL2BW in Nelson and arranged for him to come up on 1296 MHz as well. After a couple of tries Dave came through very well and we were able to have a chat.

On the 14th January I had my 1st 2424 MHz contact, which was with Steve, ZL1TPH who was out portable at Murawai. The 2nd of March bought my 2nd 2424 MHz contact, which was with ZL1AVZ Brian who was at Murawai, west of Auckland and signals were 5/2 both ways. There was rapid QSB during the contact, which was almost like aircraft flutter, and we actually spoke for a few minutes.

Nick, ZL1IU (Bay of Islands) and Chris, ZL2DX (Martinborough) are now looking at attempting the path on 2424 MHz. Lets hope conditions will allow this. Note that it would be still a few km short of the 13cm record contact made in 1982 by Tom ZL1THG and Peter ZL2ARW. That was made on NBFM... With the increased sensitivity of modern equipment and common use of CW and SSB the chances are greatly improved. Good luck. On the 2nd of March there was a small DX opening to VK with 1 or 2 stations being worked. The increased activity started some local activity on the Microwave bands. Brian ZL1AVZ, Muriwai contacted Ted, ZL2IP, Inglewood on 2424 MHz with 58 reports being received over the 280 km path. Brian also worked Nick, ZL1IU on 2424 MHz over a 185 km path with 52 reports being exchanged. Nick and Ted also tried the 440 km path on 2424 MHz but no contact resulted. Brian ZL1AVZ worked Steve ZL1TPH (at Moirs hill) on 10368 MHz over a 45 km path.

Simon, ZL1SWW and a number of others in the Auckland area are progressing on developing a 2280 MHz Local oscillator/multiplier for a 12cm transverter. The filtering at 2280 MHz can be done by a copper plumbing endcap. These are not normally available in NZ, but does anyone know of a local source? Mark VK5EME at Minikits has developed a new 2256 MHz multiplier known as the EME139. See <http://www.minikits.com.au/kits3.html>

Amplifiers

On 2m and 70 cm, some earlier (and also later) transceivers suffer from lack of sensitivity (deafness). There are modifications for some transceivers to improve their sensitivity. Most amateurs are not willing to modify the equipment, so sometimes external preamplifiers are used to improve the clarity of the incoming signal. Note on 6m, the antenna noise is higher, so that less advantage is gained from having improved sensitivity. Ideally preamplifiers should be at the masthead, however some improvement may be gained by having a preamplifier close to the transceiver. Sometimes it is part of a power amplifier. Ideally the PA/Preamplifier combination should be sequenced with the transceiver, but sometimes stations use the PA under RF detector operation. On FM this not a problem, but with SSB one hears relay chatter, which can result in chopped words. It is recommended therefore that the PA's be run using PTT control (or sequenced). When using TX amplifiers with Hot Switching of RF, the relay contacts may create burns or small welds. (Have seen this effect) Most commercial RF relays are severely derated when they are used hot switched. Another problem that may occur is that the transceiver output sees an open circuit for a fraction of a second, which may cause the VSWR foldback to react. An additional problem that may happen, is that the transceiver output may go unstable.

The preamplifier should be run with a minimum of gain, sufficient enough to improve readability of weak signals but no more. More noise and higher S-meter readings may look good, but don't improve matters. Excess gain can create havoc if strong signals and out of band signals are present.

A well designed preamplifier should have good out of band rejection and low to moderate gain. Most 2m preamps should have gain of the order of 10 to 15 dB, which is more than adequate in most situations, even for EME. Whereas some other RX stressing preamplifiers have gain of 24 to 30 dB.

Some 2m preamplifiers use exotic and often costly GaAsfet preamplifiers. However at 2m, the antenna noise is normally slightly higher than at UHF and microwave frequencies, so this extreme sensitivity given by GaAsfet designs is often not needed. Commercial preamplifiers for the amateur market are available. Homemade Mosfet designs using devices such as BF981 (hard to get/ obsolete) BF998 or a BF960 (available from the Wellington/ Auckland VHF Groups) can achieve noise figures around 1 dB or less. This may improve readability of a weak signal by up to 5 or 6 dB (depending on the transceiver). This improvement is most noticable with a weak SSB/CW signals but especially on weak FM signals. The improvement obviously occurs at greater signal strengths but is not audible due to a greater S/N ratio in the transceiver.

Often preamps have RX/TX switching or bypassing. The loss in bypass mode can be excessive due to losses/ mismatching in the bypass relay circuitry, and losses of up to 2 or 3 dB may be seen on some cheaper units.

At 70cm, the noise coming into the antenna is slightly lower, while the noise generated in Mosfets are a little higher, so generally GaAsfet designs are used, both in commercial and homemade preamps. The GaAsfets used are most often single gate Microwave types, and even HEMT devices are used, however sometimes Dual Gate GaAsfets and Mosfets are used.

At 70cm the losses in conventional relays become excessive, so coax relays are the norm.

If using masthead preamplifiers, the DC for powering the unit may be fed by external wires, but may be fed the preamplifier via the coax itself, via a sequencing unit.

The bandwidth of most commercial and homebuilt preamplifiers is often excessive and good designs have extra filtering so that the gain of the preamplifier reduces very rapidly outside of the band limits (144-148

or 430-440 MHz). Some inferior designs, both commercial and homebuilt may have significant gain at +/- 50% of their centre frequency. This may lead to overloading of the following transceiver due to out of band signals. The bandpass filtering may be done by LC networks at VHF, however helical filters are commonly used at 70cm, and to a lesser extent at 2m.

Handheld transceivers may not handle large signals as well as base station/mobiles, as the unit may have design limitations, due to the expectation that the unit will be used with less efficient antennas. So their use with a full size antenna or preamp is not recommended.

Most transverters are generally more sensitive than transceivers and may have excess gain, so a preamplifier is not recommended, unless the transverter gain is low, otherwise significant overloading may take place, both in the transverter and the following transceiver.

If any readers have feedback or questions on the use of preamplifiers contact me.

Thanks for the activity reports from a number of stations.

Input for the column may be sent to Kevin ZL1UJG at rfman@xtra.co.nz

End of VHF Scene(s)

Late news

Following on from the 47 GHz EME, there is some local activity (not EME) on 47 GHz from Steve ZL1TPH and Brian ZL1AVZ.

They have made some early tests and are looking at some longer paths currently. I am sure there will be much to report in the next issue.

That's all for now

Thanks for reading

Kevin

ZL1UJG

Looking for input for VHF Scene...